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The work of Mr. Sarkar is in no sense scholarly. As a popular exposition it may be of interest particularly to Hindus, but it is distinctly unfortunate that so much is claimed which is easy to refute. This only results in the non-acceptance even of those claims which are justified.

Kaye's work shows the truly magnificent equipment of the observatories established by Jai Singh (1686–1743). Only among the Arabs would we find any buildings which could be compared with the Delhi, Jaipur, Ujjain, Benares, and Mathura structures. At Delhi quadrants, in the plane of the equator, with a radius of 49.5 feet, are graduated to minutes; the high masonry gnomon, 7.5 feet in width and 113.5 feet in length, rises above these quadrants to a height of about 68 feet, and its shadow on the quadrants gives the apparent solar time. Two complementary concave hemispheres of masonry work, diameter 27 feet, 5 inches, formed a part of the equipment; so also did two circular buildings with inside diameter of 49.1 feet, with 30 openings each 6° in width. Other masonry instruments and metal astrolabes and armillary spheres, in large part of Persian and Arabic workmanship, still survive from the instruments which were used in these observatories. A set of astronomical tables was prepared by Jai Singh, dedicated to the Emperor Muhammad Shah, being called Zij Muhammad Shahi; these tables follow closely the methods of Ulugh Beg. However, "polar longitudes" are given, as in the Surya Siddhanta, and it is more reasonable to suppose a Hindu source than a Moslem one, as Kaye does.

The wonderful ruins of these observatories of Jai Singh are a tribute to Hindu science, revealing an unusual power of appreciation of pure science whether or not they bear direct testimony to other positive achievements of the Hindus themselves.

LOUIS C. KARPINSKI.

The Italian Universities and their Opportunities for Foreign Students. By KENNETH MCKENZIE. Roma, Tipografia Nazionale Bertero, 1919. 8vo. 16 pp.

This timely and very interesting pamphlet was written by Dr. McKenzie, professor of romance languages in the University of Illinois, but now Director of the Italian branch of the American University Union in Europe. The headings of the thirteen sections are as follows—'The Universities of Italy: their history; The universities of Italy: their present condition; Primary and secondary schools; Organization of the universities;—["The university year extends nominally from October 16 to July 31; but the instruction begins in November or even later, and ends by June 15. Examinations are as a rule given in two periods, beginning respectively October 16 and June 16"]—Registration and fees; University courses and degrees;—["The University courses are of four years in the case of the Faculties of Letters and Philosophy, Sciences and Law"]—Foreign students;—["Foreigners who have received a degree from a University of approved standing, and who can prove that they have studied all the subjects required for one of the regular degrees in Italy, are not obliged to study in residence or to take the examinations in the separate subjects, but may present themselves directly for the final examination for the degree which they desire. This does not apply, however, to the new degree mentioned below. The character of the final examination is . . . written dissertation and oral discussions."]—Requirements for the regular degrees; The new doctor's degree;—["On October 28, 1917, a new doctorate degree was established, equivalent in grade and in the amount of work required to the old four years' degrees, but not demanding their rigid selection of courses. This new degree is not professional in the sense of giving legal rights in connection with the practice of the professions in Italy, but is intended to encourage scientific attainment for the purpose of advancing knowledge and increasing the personal culture of the individual; for this reason it is sometimes referred to as a scientific degree (as opposed to professional). It was destined at first exclusively for foreigners, who would not wish to conform to the requirements of the professional curricula. In March, 1918, however, it was opened to Italians as well."]—Degrees for foreigners;—["At present no degree of higher grade than the regular laurea or the new doctorate is conferred in Italy; and from what precedes, it is obvious that the requirements for these degrees are less in amount than the requirements for the doctorate in Graduate Schools of good standing in America. It must be borne in mind, however, that for Americans the successful following of a course of university study in Italy implies residence abroad and mastery of the Italian language"]—The language; Choosing a University; —["Concise descriptions of all the Universities and other higher institutions in Italy, including libraries and learned societies, with lists of the professors and other officials, will be found in the *Annuario degli Istituti Scientifici Italiani*, compiled by Professor Silvio Pivano for the Associazione Italiana per l'Intesa Intellettuale fra i Paesi Alleati ed Amici (Rome, 1918; price 10 lire)."]—Special provisions 1919–1920.

Number Stories of Long Ago. By D. E. SMITH. Boston, Ginn, 1919. 12mo. 7 + 136 pp. + 8 plates in color. Price 48 cents.

Extract from "Preface number two for the grown-ups, and not worth reading"—

". . . This book is intended for supplementary reading in the elementary school. It is written in nontechnical language, and the effort has been made to connect with the history enough of the human element to make it more interesting than any mere recital of facts. With it there is also joined something of the history of writing materials, this being connected naturally with the story of our numbers. Chapters I–VIII can easily be read aloud, and the Question Box at the end of each chapter can be used as a basis for conversation or for written work.

"The facts stated in the book are as nearly exact as the circumstances permit. It is not to be expected, however, that changes in the form of various numerals will be considered. Such changes are of no moment in a work of this nature and do not contradict the statement that the historical facts are presented with substantial accuracy.

"It is the author's hope that this little series of human incidents will create a new interest not merely in the study of arithmetic but in the story of the development of our civilization."

The solutions of the problems in chapters IX and X of *Number Stories* have been given by D. E. SMITH in a fourteen page pamphlet entitled: *Number Puzzles before the Log Fire.*

Essentials of Algebra and Geometry. By F. M. MORGAN. New York, Association Press, 1919. 12mo. 58 pp.

This is the second of the series, published under the direction of Professor J. W. Young for the National War Work Council of Young Men's Christian Associations, to which reference has been made already in the MONTHLY (March, 1919). It contains six lessons preparatory to the study of trigonometry. The requirement has been cut down to a minimum and it is intended that everything given shall be of importance. There are numerous "Exercises," "Oral review exercises" and "Review exercises."

NOTES.

The *Harvard Alumni Bulletin* for April 24, 1919, contains the report by a Faculty Committee (of which Professor G. D. BIRKHOFF is a member) on General Final Examinations for Degrees. Such examinations are not to be used in the Divisions of Mathematics and the Natural Sciences.

The twenty-page *List of Members, 1919,* of the Indian Mathematical Society contains 195 names. Of these one name is that of a "Patron," one of an "Honorary Member," and nine of "Life Members." Of the 185 "Ordinary Members" only one resides outside of India.